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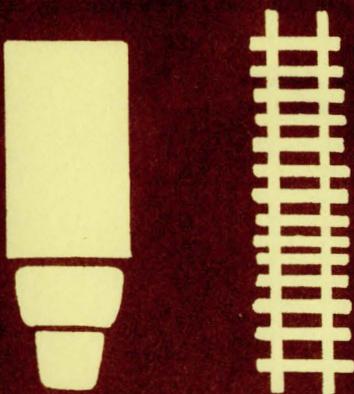
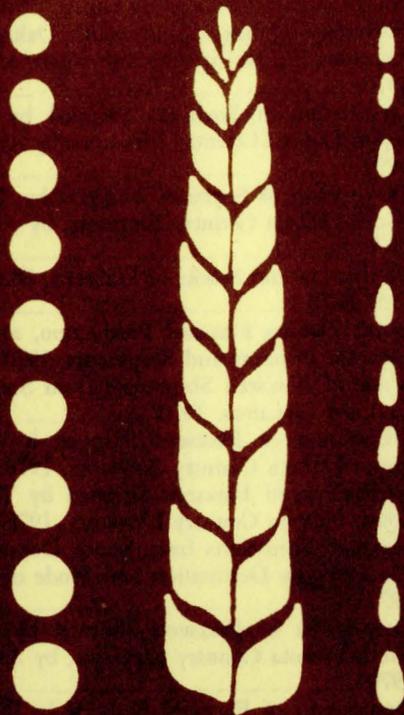
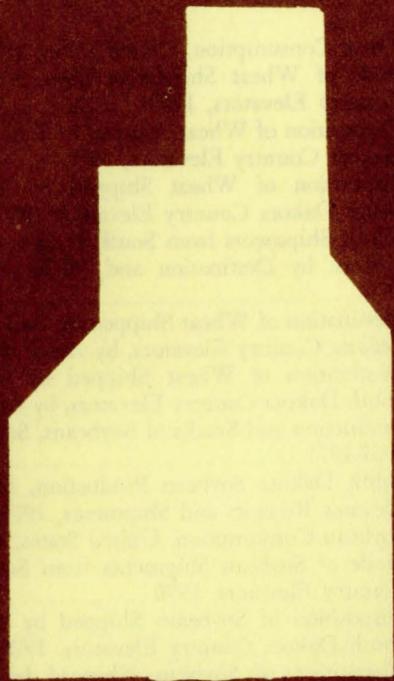
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Primary Destinations of South Dakota Wheat, Soybeans And Flaxseed

SOUTH DAKOTA STATE UNIVERSITY, BROOKINGS

AGRICULTURAL EXPERIMENT STATION

**Bulletin 601
Sept. , 1972**

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*This study was conducted under South Dakota Agricul-
tural Experiment Station Project 583, "Transportation of
Grain and Farm Supplies Within South Dakota."*

PRIMARY DESTINATIONS OF SOUTH DAKOTA WHEAT, SOYBEANS AND FLAXSEED, 1970

By
William F. Payne¹

INTRODUCTION

The South Dakota economy is dominated by agriculture, with gross farm income accounting for \$1.01 billion in 1970. This places South Dakota among the top ten states in production of the nation's crops and livestock. South Dakota farmers and ranchers are heavily dependent upon transportation services because most agricultural production is shipped out-of-state for processing or feeding.

The grain elevator industry, because it operates on small margins, is especially dependent upon fast, efficient transportation to acquire and ship the necessary volume to remain profitable. However, changes in two major areas have created concern for the structure of South Dakota's elevator industry. First, during the 1960-1970 period, the number of South Dakota grain elevators decreased 25 percent, from 533 to 401. This indicates the need for greater volume at remaining elevators and possibly greater transportation costs from farm to elevator. Secondly, from 1960-1970 railroads in South Dakota abandoned 362 miles of track.

Railroad abandonment is especially critical to South Dakota's agriculturally-oriented economy because abandonment often threatens the survival of grain elevators and other agri-business firms. The problem of abandonment is becoming more critical because it has been occurring at an increasing rate in recent years, and is likely to proceed even faster in the future. For example, the Interstate Commerce Commission (ICC) has introduced new procedures designed to speed rail abandonment proceedings.² One proposal would consider less than 34 cars per mile annual volume on a track as establishing a *prima facie* case for abandonment. Such a rule, if implemented, would jeopardize the survival of many South Dakota grain elevators and farm supply firms. At the present time the ICC proposals to speed abandonment have been postponed because of a Federal Court injunction.

METHODOLOGY

Questionnaires were mailed to managers of 401 country grain elevators. South Dakota does not have terminal elevators, so results are based upon an expansion of usable returns from 185 country elevators. Estimates are based upon individual expansion factors for each area and for each of four elevator sizes determined by storage capacity. Elevators were classified according to the following storage capacities: less than 200,000 bushels; 200,000-399,999 bushels; 400,000-599,999 bushels; 600,000 bushels and larger.

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In addition, Congressional action has been proposed to speed abandonment. The Surface Transportation Act (S. 2362) and the Transportation Regulatory Modernization Act (S.2842) each contain provisions which would make many additional branch lines eligible for rapid abandonment.

Declining grain elevator numbers plus railroad abandonment also may result in future grain shipment patterns substantially different from current patterns. For example: (1) future patterns may shift to alternative destinations because of changing relative transportation costs, (2) future transportation services may dictate substantial changes in the location of grain elevators, or (3) method of shipment may change, increasing the relative importance of trucks or railroads. In addition, remaining elevators may need to expand in order to supply services no longer provided by elevators that have quit operating.

Because abandonment may be economically justified in several instances, it becomes important for affected areas to prepare long-range transportation plans in an effort to prevent un-coordinated termination of rail transportation service. Such a plan also may call for the building of additional track in certain areas. One step in developing such a plan for South Dakota is to determine transportation requirements for agricultural products. The present study is designed to provide basic data concerning the movement of South Dakota wheat, soybeans and flaxseed. This information can be used to plan future transportation needs for the state and aid in planning locations of grain elevators and other agri-business firms. If South Dakotans are to have an informed voice in the transportation development of their state it is important to first study the volume and destination of shipments moving into and out of the state.

A companion bulletin is being prepared which will quantify the movement of corn, oats, grain sorghum, and barley.

Usable returns were obtained from 46 percent of the elevators, accounting for 44 percent of the state's elevator storage capacity (Table 1).

For the purpose of this study South Dakota was divided into six areas. Figure 1 indicates the boundaries used to permit more accurate analysis of different grain flow patterns. Note that the area west of the Missouri River was treated as a single unit due to the less intensive production of grain. Usable elevator response ranged from 36.9 percent in area I to 53 percent in area VI with a state average of 43.6 percent.

²Interstate Commerce Commission, Ex Parte No. 274 (Sub-No. 1). February, 1972.

Table 1. Questionnaires Returned and Percent of Total Elevator Capacity—Number and Percent of Firms Responding, 1970.

Area	No. of Firms	% of total firms	Capacity (bushels)	% of total capacity
I All elevators	72	100.0	15,536,076	100.0
	Returned	28	38.9	5,729,462
Not returned	44	61.1	9,806,614	63.1
II All elevators	81	100.0	20,530,580	100.0
	Returned	42	51.9	9,508,795
Not returned	39	48.1	11,021,785	53.7
III All elevators	71	100.0	12,891,292	100.0
	Returned	31	43.7	4,918,242
Not returned	40	56.3	7,973,050	61.8
IV All elevators	34	100.0	6,161,323	100.0
	Returned	18	52.9	3,196,787
Not returned	16	47.1	2,964,536	48.1
V All elevators	78	100.0	11,940,951	100.0
	Returned	31	39.7	5,104,225
Not returned	47	60.3	6,836,726	57.3
VI All elevators	65	100.0	8,173,836	100.0
	Returned	35	53.8	4,328,286
Not returned	30	46.2	3,845,550	47.0
State All elevators	401	100.0	75,234,058	100.0
	Returned	185	46.1	32,785,797
Not returned	216	53.9	42,448,261	56.4

Source: Capacity information obtained from South Dakota Public Utilities Commission. "South Dakota Grain Elevators Licensed by the Public Utilities Commission 1970-1971." (Pierre, South Dakota Public Utilities Commission, 1971.)

WHEAT

Supply and Demand

Crop production in 1970 was less than 1969 production for most field crops. The South Dakota cash crops production index of 118 for 1970 was 11 percent below the 133 index for 1969 (1957-59=100).³ The 1970 harvested acreage of wheat was 1,811,000 acres with an average yield of 21.7 bushels per acre. This

compares to the 1969 wheat acreage of 1,963,000 and average yield of 21.9 bushels per acre. See Figure 2 for a breakdown of total wheat production by area. Annual production for the period 1967-1971 is contained in Table 2.

South Dakota grain elevators received an estimated 40,667,000 bushels of wheat during calendar year 1970, with out-shipments accounting for 40,167,000 bushels. Since the survey covers calendar year 1970, wheat receipts and shipments may include production from the 1970 crop or from previous years. Inventory adjustments by farmers and the Commodity Credit Corporation (CCC) also contribute to receipts and shipment volume. Table 3 shows that 1970 wheat receipts were 104 percent of production with shipment being 102% of production. Higher wheat prices resulted in inventory adjustment, with some wheat being sold during 1970 which would have ordinarily been stored and sold in 1971.

Southern leaf blight reduced corn supplies in most corn producing states during 1970, resulting in a significant increase in corn prices. Table 4 shows that South Dakota corn prices for 1970 were about 17 cents per bushel above the 1967-69 average. High corn prices were a major factor contributing to an increased volume of wheat moving into feed channels during 1970. Table 5 indicates that wheat for feed showed a 23 percent nation-wide increase during 1969-70 and 1970-71 compared to 1968-69.⁴ January 1, 1970 on-farm wheat storage of 60,081,000 bushels had been reduced to 50,281,000 bushels at years end. During the same period off-farm storage increased slightly from 19,604,000 bushels to 20,767,000 bushels (Table 2).

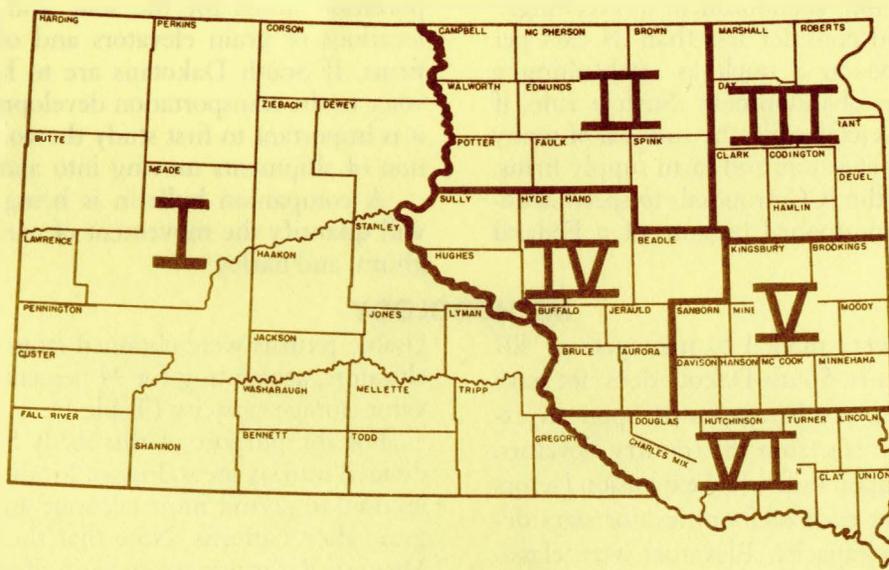


Figure 1. Areas used in reporting origins and destinations of South Dakota grain shipments

³Cash crops include wheat, flaxseed, soybeans, and rye.

⁴Calendar year 1970 storage statistics include wheat from crop years 1969-70 and 1970-71 and possibly other years.

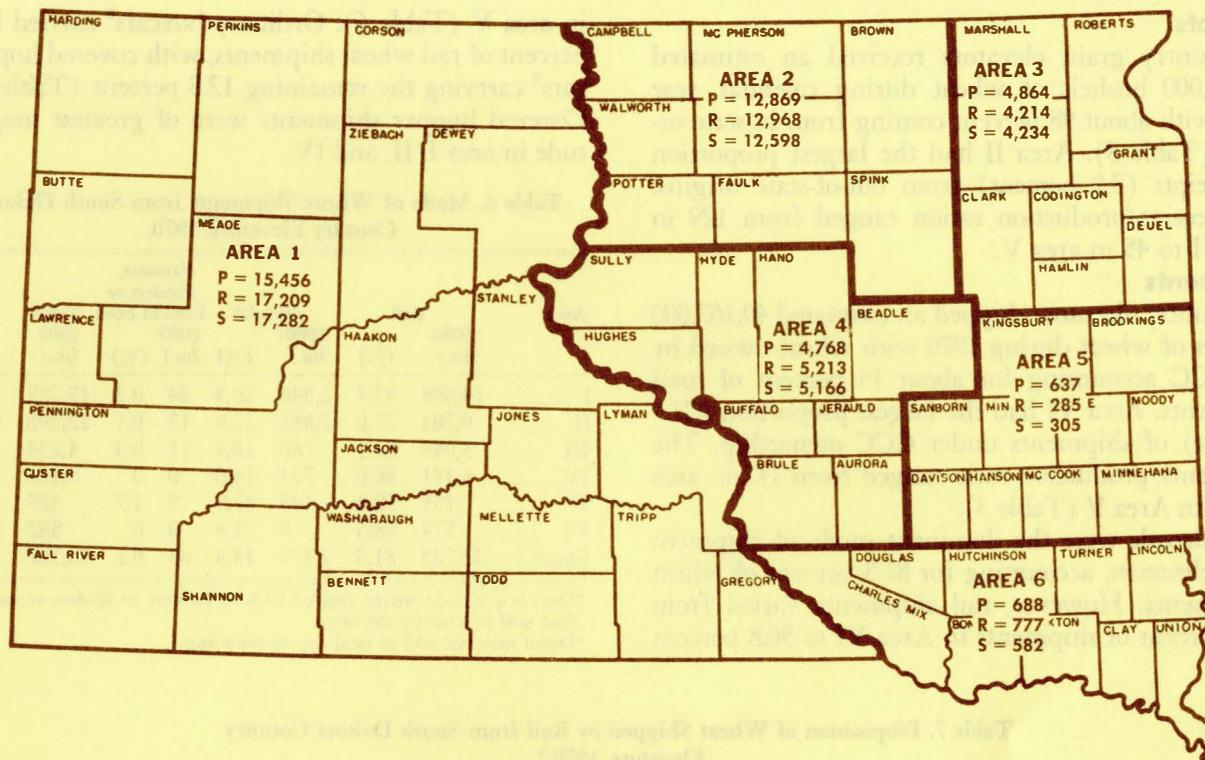


Figure 2. Wheat production (P) and country elevator receipts (R) and shipments (S), by area, 1970 (000 bu.)

Table 2. Production and Stocks of Wheat, South Dakota, 1967-71

Year	Production* (000 bu.)	Farm (000 bu.)	Storage† Off Farm (000 bu.)	Total (000 bu.)
1967	73,061	42,668	22,136	64,804
1968	65,729	54,065	19,058	73,123
1969	42,915	61,785	22,582	84,367
1970	39,282	60,081	19,604	79,685
1971	68,768	50,281	20,767	71,048

Source (1) South Dakota Crop and Livestock Reporting Service, *South Dakota Agriculture 1967-1970* (Sioux Falls, South Dakota and United States Department of Agriculture, 1967-1970).

(2) *Ibid.*, *South Dakota Crop and Livestock Reporter*, January 26, 1972.

*Crop year begins July 1 of year stated.

†Wheat in storage January 1 of year stated.

Table 4. Prices Received by South Dakota Farmers for Selected Crops, 1967-1970*

Year	Corn	Grain		
		Wheat	Flaxseed	Soybeans
		(dollars)		
1967	1.04	1.40	2.99	2.44
1968	1.04	1.31	2.82	2.37
1969	1.03	1.36	2.68	2.26
1970	1.21	1.51	2.45	2.65

Source: South Dakota Crop and Livestock Reporting Service, *South Dakota Agriculture 1970* (Sioux Falls, South Dakota and United States Department of Agriculture, 1970).

*Season average prices are computed by weighing mid-month prices by estimated monthly marketings.

Table 3. South Dakota Wheat Production, and Country Elevator Receipts and Shipments, 1970.

Area	Pro- duction (000 bu.)	Receipts* (000 bu.)	Receipts/ Production (%)	Ship- ments† (000 bu.)	Ship- ments/ Production (%)
I	15,456	17,209	111	17,282	112
II	12,869	12,968	101	12,598	98
III	4,864	4,214	87	4,234	87
IV	4,768	5,213	109	5,166	108
V	637	285	45	305	48
VI	688	777	129	582	85
State‡	39,282	40,667	104	40,167	102

Source: Production data from South Dakota Crop and Livestock Reporting Service, *South Dakota Agriculture, 1970* (Sioux Falls, South Dakota and United States Department of Agriculture, 1970).

*Out-of-state origins accounted for the following proportion of receipts: Area I, 0.9 percent; Area II, 3.9 percent; Area III, 0.9 percent; Area VI, 0.1 percent; State average, 1.7 percent.

†Wheat owned by the Commodity Credit Corporation accounted for the following proportions of shipments: Area I, 16.9 percent; Area II, 9.7 percent; Area III, 7.4 percent; Area IV, 21.4 percent; State average, 13.9 percent.

Shipments also include wheat retained back to farmers or feeders or used in feed by country elevators.

‡Detail may not add to total due to rounding.

Table 5. Wheat Consumption, United States, 1966-1971.

Year beginning July 1	Domestic Use			TOTAL (Million Bushels)	Export Use TOTAL
	Food	Seed	Feed		
1966	502	78	99	679	744
1967	519	72	57	648	761
1968	520	61	173	754	544
1969	521	57	213	791	606
1970	525	60	214	799	735

Source: U. S. Department of Agriculture, *Wheat Situation*, Economic Research Service, 1966-1970.

Receipts

Country grain elevators received an estimated 40,667,000 bushels of wheat during calendar year 1970, with about 98 percent coming from in-state origins (Table 3). Area II had the largest proportion of receipts (3.9 percent) from out-of-state origins. The receipt/production ration ranged from 129 in area VI to 45 in area V.

Shipments

Country elevators shipped an estimated 40,167,000 bushels of wheat during 1970 with wheat owned by the CCC accounting for about 14 percent of total shipments. Area VI had the largest proportion (21.4 percent) of shipments under CCC ownership. The shipments/production ratio ranged from 112 in area I to 48 in Area V (Table 3).

Railroads were the dominant mode of shipment from elevators, accounting for 81.5 percent of wheat movements. However, rail shipments varied from 98.6 percent of shipments in Area VI to 50.8 percent

in area V (Table 6). Ordinary boxcars⁵ carried 87.2 percent of rail wheat shipments, with covered hopper cars⁶ carrying the remaining 12.8 percent (Table 7). Covered hopper shipments were of greatest magnitude in area I, II, and IV.

Table 6. Mode of Wheat Shipments from South Dakota Country Elevators, 1970.

Area	Rail		Truck*		Farmers, Feeders or Used in Feed		Total (000 bu.)	(%)
	(000 bu.)	(%)	(000 bu.)	(%)	(000 bu.)	(%)		
I	14,408	83.4	2,840	16.4	34	0.2	17,282	100
II	9,704	77.0	2,881	22.9	13	0.1	12,598	100
III	3,443	81.3	780	18.4	11	0.3	4,234	100
IV	4,441	86.0	724	14.0	0	0	5,166	100
V	155	50.8	145	47.5	5	1.7	305	100
VI	574	98.6	8	1.4	0	0	582	100
State†	32,725	81.5	7,379	18.4	63	0.1	40,167	100

*Does not include wheat retailed back to farmers or feeders or used in feed sold by country elevators.

†Detail may not add to total due to rounding.

Table 7. Disposition of Wheat Shipped by Rail from South Dakota Country Elevators, 1970.*

Area	Disposition								
	A		B		C		D		E
	In-State (000 bu.)	(%)	Out-of-State (000 bu.)	(%)	Ordinary Boxcars (000 bu.)	(%)	Covered Hopper Cars (000 bu.)	(%)	Total (000 bu.)
I	1,075	7.5	13,331	92.5	12,330	85.6	2,078	14.4	14,408
II	133	1.4	9,571	98.6	8,284	85.4	1,420	14.6	9,704
III	0	0	3,443	100.0	3,336	96.9	107	3.1	3,443
IV	0	0	4,441	100.0	3,884	87.5	557	12.5	4,441
V	0	0	155	100.0	155	100.0	0	0	155
VI	0	0	574	100.0	556	96.9	18	3.1	574
State†	1,208	3.7	31,515	96.3	28,544	87.2	4,181	12.8	32,725

*A + B = C + D = E

†Detail may not add to total due to rounding.

Table 8. Disposition of Wheat Shipped by Truck from South Dakota Country Elevators, 1970.*

Area	Disposition								
	A		B		C		D		E
	In-State (000 bu.)	(%)	Out-of-State (000 bu.)	(%)	Backhaul (000 bu.)	(%)	One-Way (000 bu.)	(%)	Total† (000 bu.)
I	0	0	2,840	100.0	1,219	42.9	1,621	57.1	2,840
II	0	0	2,881	100.0	675	23.4	2,206	76.5	2,881
III	0	0	780	100.0	7	0.9	772	99.1	780
IV	4	0.6	720	99.4	352	48.5	373	51.5	724
V	5	3.5	140	96.5	44	30.5	101	69.5	145
VI	0	0	8	100.0	0	0	8	100.0	8
State†	9	0.1	7,370	99.9	2,298	31.1	5,081	68.9	7,379

*Does not include wheat retailed back to farmers or feeders or used in feed sold by country elevators.

†A + B = C + D = E

‡Detail may not add to total due to rounding.

⁵Ordinary boxcars are loaded and unloaded through side doors, and hold approximately 1666-1833 bushels of wheat.

⁶Medium-sized, covered hopper cars used in South Dakota are top loading, bottom unloading rail cars that hold approximately 3,333 bushels of

wheat. However, covered hopper cars are seldom loaded to capacity in South Dakota because most tracks cannot support the 267,000 pound weight (200,000 pound load and 67,000 pound rail car).

Truck shipment of wheat from South Dakota country elevators during 1970 amounted to 18.5 percent of total shipments. Trucks were relatively more important in area V and area II (Table 6).

About 69 percent of wheat shipments by truck were by one-way grain haulers⁷ with backhaul loads⁸ accounting for the remaining 31.1 percent. However, backhaul loads were relatively more important in areas I and IV, providing about half of truck shipments in these areas (Table 8). Wheat retailed back to farmers or feeders or used in feed sold by country elevators was relatively unimportant, accounting for only 0.1 percent of total shipments (Table 6).

Destination

Out-of-state destinations received over 96 percent of rail shipments and almost 100 percent of truck shipments (Table 9). Minnesota was the primary destination for both modes. A more detailed analysis of shipment destination is provided in Tables 10 (rail) and 11 (truck). Shipments from South Dakota to Iowa are assumed to continue on to other states because Iowa does not contain major wheat processing facilities.

SOYBEANS

Supply and Demand

An increase in soybean acreage during 1970 was accompanied by a decrease in yield per acre. South Dakota farmers harvested 255,000 acres of soybeans with an average yield of 17.5 bushels per acre compared to 243,000 acres during 1969 with a yield of 24.5 bushels per acre. Total production by area is indicated in Figure 3. The primary source of crop damage was hot, dry weather which severely depleted topsoil moisture supplies in July and August. Annual pro-

Table 9. Wheat Shipments from South Dakota Country Elevators, by Destination and Mode of Shipment, 1970.*

Destination	Mode			
	Rail (000 bu.)	(%)	Truck† (000 bu.)	(%)
Aberdeen	209	0.6		
Brookings			9	0.1
Rapid City	999	3.1		
South Dakota (sub-total) ..	1,208	3.7	9	0.1
Iowa	3,489	10.7	59	0.8
Kansas	294	0.9		
Minnesota	25,443	77.8	7,264	98.5
Nebraska	1,057	3.2	47	0.6
Oregon	487	1.5		
Washington	746	2.3		
Out-of-State (sub-total) ..	31,516	96.3	7,370	99.9
Total Shipments‡	32,724	100.0	7,379	100.0

*Destination of 0.9 percent of the truck traffic was reported as "unknown" and was allocated in proportion to distribution of known truck shipments.

†Does not include wheat retailed back to farmers or feeders or used in feed sold by country elevators.

‡Detail may not add to total due to rounding.

⁷A one-way grain hauler indicates that grain is the primary load for the truck.

duction for the period 1967-1971 is contained in Table 12.

Soybean receipts at country elevators during 1970 were an estimated 5,951,000 bushels, with out-shipments of 6,374,000 bushels. Inventory reductions by farmers and the CCC caused elevator receipts to be 133 percent of production and shipments to be 143 percent of production (Table 13).

Strong domestic and export demand during 1970 was reflected in higher soybean prices and reduction in farm and CCC storage. United States soybean use during 1970 was 1,267 million bushels, compared to 1,221 million bushels in 1969 and 945 million bushels in 1968 (Table 14). Soybean prices to South Dakota farmers averaged \$2.65 per bushel during 1970 com-

Table 10. Destination of Wheat Shipped by Rail from South Dakota Country Elevators, by Area, 1970.

Destination	Area					
	I	II	III	IV	V	VI
	(000 bu.)					
Aberdeen	76	133				
Rapid City	999					
In-State (sub-total) ..	1,075	133				
Sioux City, Iowa ..	2,042	209	27	222	56	574
Kansas City, Kansas ..		21				
Leavenworth, Kan.	98					
Topeka, Kansas		175				
Minneapolis, Minn.	9,514	8,229	3,381	4,219	99	
Fremont, Nebraska ..	527	167				
Omaha, Nebraska ..	29	334				
Portland, Oregon	414	55	17			
Seattle, Washington ..	347	382	17			
Out-of-State (sub-total)	13,331	9,572	3,443	4,441	155	574
Total Shipments*	14,408	9,704	3,443	4,441	155	574

*Detail may not add to total because of rounding.

Table 11. Destination of Wheat Shipped by Truck from South Dakota Country Elevators, by Area, 1970.

Destination	Area					
	I	II	III	IV	V	VI
	(000 bu.)					
Brookings				4	5	
In-State (sub-total) ..				4	5	
Des Moines, Iowa				32		
Sioux City, Iowa					15	8
Duluth, Minn.		9				
Lake City, Minn.	33					
Mankato, Minn.	5					
Minneapolis, Minn.	2,520	2,668	774	622	114	
Savage, Minn.		147	6	11		
Winona, Minn.	236			55		
Omaha, Nebraska	47					
Out-of-State (sub-total) ..	2,840	2,824	780	720	129	8
Unknown		57			11	
Total Shipments*	2,840	2,881	780	724	145	8

*Detail may not add to total because of rounding.

⁸A backhaul load indicates that the primary load is something other than grain. When the trucker returns to his starting area he backhauls a load of grain.

pared to \$2.26 during 1969 (Table 4). This 15 percent increase in price contributed to a farm storage reduction of 29 percent and an off-farm storage reduction of 43 percent (Table 12). Storage reductions in turn caused 1970 country elevator receipts and shipments to exceed production.

Receipts

South Dakota soybean production is concentrated in areas III, V and VI. Elevators in these areas received an estimated 5,951,000 bushels of soybeans during calendar year 1970, with about 96 percent coming from in-state origins. However, area III reported about 15 percent of receipts coming from out-of-state origins (Table 13). The receipt/production ratio ranged from 148 in area VI to 73.7 in area III.

Shipments

Country elevators shipped an estimated 6,374,000 bushels of soybeans during 1970, with 9.5 percent being owned by the CCC. Soybeans owned by the CCC ranged from 35.4 percent of shipments in area III to 6.6 percent in area VI (Table 13). The ratio of shipments/production was 90.1 percent in area III and 162 percent in area VI.

Trucks were the primary mode of shipment from elevators. Truck shipments ranged from 53.3 percent of soybean shipments in area III to 65.5 percent in area VI (Table 15). Backhauls of soybeans accounted

for 56.1 percent of truck shipments compared to 43.9 percent by one-way grain haulers. Backhaul loads accounted for 70.5 percent of soybean shipments by truck in area III (Table 16). Soybeans retailed back to farmers were only 0.1 percent of total shipments (Table 15).

Railroad shipments of soybeans ranged from 46.7 percent in area III to 34.4 percent in area VI (Table 15). Elevator managers responding to the survey indicated that all soybeans shipped by rail moved in ordinary boxcars (Table 17).

Destination

Out-of-state destinations received all rail shipments and 96 percent of truck movements (Table 18). Iowa destinations received about 67 percent of rail shipments with Minnesota points receiving about 31 percent. Truck shipments went primarily to Iowa. A more detailed analysis of shipment destination is provided in Tables 19 (rail) and 20 (truck). Shipments to Minnesota go to processing facilities located at Minneapolis, Mankato, and Dawson. However, some shipments to Minneapolis continue to other areas for processing. Shipments to Iowa go primarily to processing facilities at Sheldon. Soybean shipments to Sioux Falls, South Dakota, enter storage, and later continue primarily to Sheldon, Iowa, for processing.

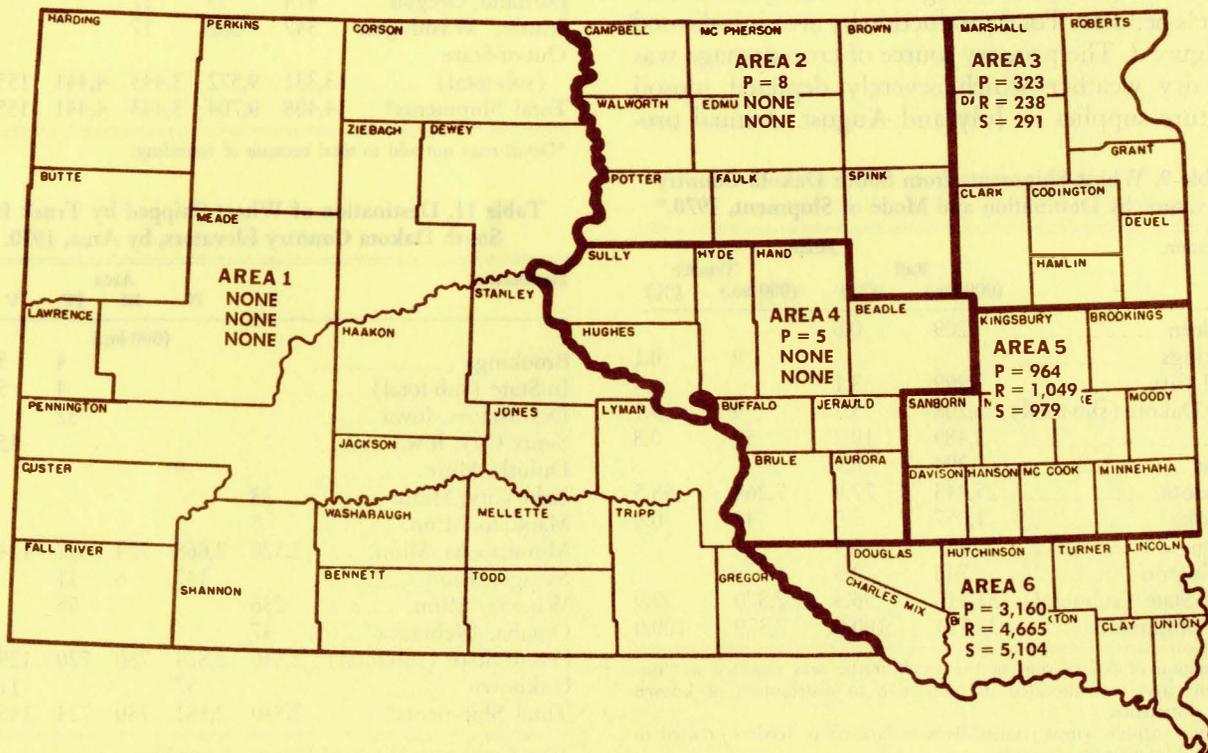


Figure 3. Soybean Production (P), Country Elevator Receipts (R), and Shipments (S), by Area, 1970 (000 Bu.).

Table 12. Production and Stocks of Soybeans, South Dakota, 1967-1971.

Year	Production*	Storage†		Total
		Farm	Off-Farm	
		(000 bu.)		
1967	6,105	3,668	1,527	5,195
1968	5,250	2,869	908	3,777
1969	5,954	2,572	717	3,289
1970	4,463	2,322	1,298	3,620
1971	5,040	1,651	739	2,390

Source 1. South Dakota Crop and Livestock Reporting Service, *South Dakota Agriculture 1967-1970*, (Sioux Falls, South Dakota and United States Department of Agriculture, 1967-70).

2. Ibid., *South Dakota Crop and Livestock Reporter*, January 26, 1972.

*Crop year begins September 1 of year stated.

†Soybeans in storage January 1 of year stated.

Table 13. South Dakota Soybean Production, and Country Elevator Receipts and Shipments, 1970

Area	Production (000 bu.)	Receipts* (000 bu.)	Receipts/Production (%)	Shipments† (000 bu.)	Shipments/Production (%)
I	0	0	0	0	0
II	8	0	0	0	0
III	323	238	73.7	291	90.1
IV	5	0	0	0	0
V	964	1,049	108.0	979	102.0
VI	3,160	4,665	148.0	5,104	162.0
State‡	4,463	5,951	133.0	6,374	143.0

Source: Production data from South Dakota Crop and Livestock Reporting Service, *South Dakota Agriculture, 1967-1970* (Sioux Falls, South Dakota and United States Department of Agriculture, 1967-1970).

*Out-of-state origins accounted for the following proportions of receipts: Area III, 14.7 percent; Area VI, 4.0 percent; state average, 3.8 percent.

†Soybeans owned by the Commodity Credit Corporation accounted for the following proportions of shipments: Area III, 35.4 percent; Area V, 17.1 percent; Area VI, 6.6 percent; state average, 9.5 percent. Shipments also include soybeans retailed back to farmers.

‡Detail may not add to total because of rounding.

Table 14. Soybean Consumption, United States, 1966-1971.

Year Beginning September 1	Crushings	Disposition			Total Disposition
		Domestic Use	Residential*	Exports	
		(million bushels)			
1967	576	48	9	633	267
1968	606	48	5	658	287
1969	737	49	6	792	429
1970	760	52	22	834	433

Source: U. S. Department of Agriculture, *Fats and Oils Situation*. Washington; Economic Research Service, 1967-1970.

*Includes use for feed, direct use for food and loss.

Table 15. Mode of Soybean Shipments from South Dakota Country Elevators, 1970.

Area	Rail		Truck*		Farmers, Feeders or Used in Feed		Total	
	(000 bu.)	(%)	(000 bu.)	(%)	(000 bu.)	(%)	(000 bu.)	(%)
I	0	0	0	0	0	0	0	0
II	0	0	0	0	0	0	0	0
III	135	46.7	155	53.3	0	0	291	100
IV	0	0	0	0	0	0	0	0
V	386	39.3	594	60.7	0	0	979	100
VI	1,759	34.4	3,342	65.5	3	0.05	5,104	100
State†	2,280	35.7	4,091	64.2	3	0.1	6,374	100

*Does not include soybeans retailed back to farmers.

†Detail may not add to total because of rounding.

Table 16. Disposition of Soybeans Shipped by Truck from South Dakota Country Elevators, 1970.*

Area	Disposition								
	A In-State		B Out-of-State		C Backhaul		D One-Way		E Total†
	(000 bu.)	(%)	(000 bu.)	(%)	(000 bu.)	(%)	(000 bu.)	(%)	(000 bu.)
I	0	0	0	0	0	0	0	0	0
II	0	0	0	0	0	0	0	0	0
III	0	0	155	100.0	109	70.5	46	29.5	155
IV	0	0	0	0	0	0	0	0	0
V	147	25.7	447	74.3	223	37.6	370	62.4	594
VI	0	0	3,342	100.0	1,960	58.7	1,381	41.3	3,342
State‡	147	3.6	3,944	96.4	2,293	56.1	1,798	43.9	4,091

*Does not include soybeans retailed back to farmers.

†A + B = C + D = E

‡Detail may not add to total because of rounding.

Table 17. Disposition of Soybeans Shipped by Rail from South Dakota Country Elevators, 1970.*

Areas	A		B		Disposition C		D		E
	In-State (000 bu.)	(%)	Out-of-State (000 bu.)	(%)	Ordinary (000 bu.)	Boxcars (%)	Covered (000 bu.)	Hopper Cars (%)	Total (000 bu.)
I	0	0	0	0	0	0	0	0	0
II	0	0	0	0	0	0	0	0	0
III	0	0	135	100.0	135	100	0	0	135
IV	0	0	0	0	0	0	0	0	0
V	0	0	386	100.0	386	100	0	0	386
VI	0	0	1,759	100.0	1,759	100	0	0	1,759
State†	0	0	2,280	100.0	2,280	100	0	0	2,280

*A + B = C + D = E

†Detail may not add to total because of rounding.

Table 18. Soybean Shipments from South Dakota Country Elevators, by Destination and Mode of Shipment, 1970*

Destination	Mode			
	Rail (000 bu.)	(%)	Truck† (000 bu.)	(%)
Sioux Falls			135	3.3
South Dakota (sub-total)			135	3.3
Iowa	1,532	67.2	3,547	86.7
Kansas	30	1.3		
Minnesota	699	30.7	409	10.0
Nebraska	19	0.8		
Out-of-state (sub-total)	2,280	100.0	3,956	96.7
Total Shipments‡	2,280	100.0	4,091	100.0

*Destination of 0.5 percent of the truck traffic was reported as "unknown" and was allocated in proportion to distribution of known truck shipments.

†Does not include soybeans retailed back to farmers.

‡Detail may not add to total due to rounding.

Table 20. Destination of Soybeans Shipped by Truck from South Dakota Country Elevators, by Area, 1970.

Destination	Area					
	I	II	III	IV	V	VI
Brookings						
Sioux Falls					135	
In-State (sub-total)					135	
Sheldon, Iowa					80	161
Sioux City, Iowa					105	3,181
Dawson, Minnesota			130		184	
Minneapolis, Minnesota			9		49	
Red Wing, Minnesota					19	
Savage, Minnesota			17			
Out-of-State (sub-total)			155		437	3,342
Unknown					22	
Total Shipments*			155		594	3,342

*Detail may not add to total because of rounding.

Table 19. Destination of Soybeans Shipped by Rail from South Dakota Country Elevators, by Area, 1970.

Destination	Area					
	I	II	III	IV	V	VI
Sheldon, Iowa					25	
Sioux City, Iowa					248	1,259
Fredrick, Kansas						22
Kansas City, Kansas						8
Dawson, Minnesota			11			
Mankato, Minnesota					40	451
Minneapolis, Minnesota			124		50	
Savage, Minnesota					22	
Lincoln, Nebraska						19
Out-of-state (sub-total)			135		386	1,759
Total Shipments*			135		386	1,759

*Detail may not add to total because of rounding.

FLAXSEED

Supply and Demand

Flaxseed acreage increased during 1970 but production recorded a substantial drop due to hot, dry growing conditions. Flaxseed harvested during 1970 amounted to 704,000 acres with a yield of 10.5 bushels per acre compared to 652,000 acres for 1969 with a yield of 14.5 bushels per acre. Figure 4 details flaxseed production by area. Annual production for the period 1967-1971 is shown in Table 21.

South Dakota farm prices for flaxseed dropped nine percent during 1970, continuing a downward trend which started in 1968 (Table 4). Lower farm prices forced a greater proportion of the smaller crop into storage, with the result that storage volume remained relatively constant in 1970 (Table 21).

Receipts

Country elevators received an estimated 6,735,000 bushels of flaxseed during 1970, with out-of-state origins accounting for only 2.3 percent (Table 22). The receipt/production ratio average of 91 percent was largely the result of low prices and relatively constant farm inventory holdings. Receipts exceeded production only in area V, where the receipt/production ratio was 110 percent.

Shipments

Shipments of flaxseed from South Dakota country elevators were an estimated 6,043,000 bushels, resulting in a shipment/production ratio of 81.8 percent (Table 22). Low market prices contributed to the relatively high CCC ownership (31.5 percent) of flaxseed shipments. Flaxseed owned by the CCC ranged from 48 percent of shipments in area I to 22.7 percent in area IV.

On a statewide basis railroads carried 65.4 percent of flaxseed shipments with trucks responsible for the remaining 34.4 percent. However, trucks were the dominant mode of transportation in area I, with 53.3 percent of shipments (Table 23). Table 24 shows

that ordinary boxcars carried 78.4 percent of rail shipments, covered hopper cars 21.6 percent. Truck shipments were primarily by one-way grain haulers. However, area IV reported that backhaul loads accounted for 92.5 percent of flaxseed shipments (Table 25).

Destination

Out-of-state destinations received 100 percent of rail shipments and 99 percent of truck shipments (Table 26). Minnesota points received virtually all flaxseed shipments. A more detailed analysis of shipment destinations is provided in Tables 27 (rail) and 28 (truck). In-state flaxseed shipments are assumed to continue to other states because South Dakota does not contain flaxseed processing facilities.

Major flaxseed processing facilities are located at Minneapolis, but some shipments there probably go to other states for processing. Red Wing and Winona, Minnesota, are major river ports for shipment of flaxseed to other areas. Shipments to Sioux City, Iowa, are assumed to continue on to other areas because Sioux City does not contain known flaxseed processing facilities.

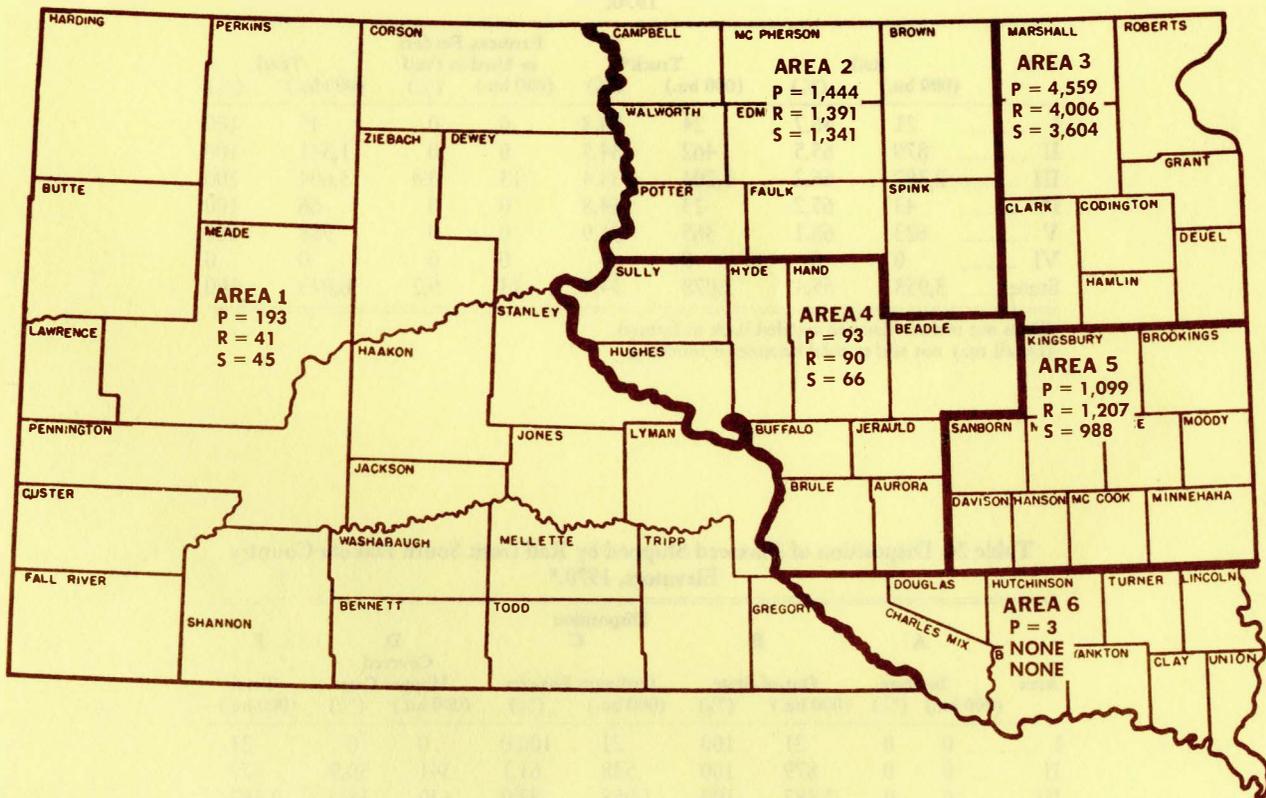


Figure 4. Flaxseed Production (P), Country Elevator Receipts (R), and Shipments (S), by Area, 1970 (000 Bu.)

Table 21. Production and Stocks of Flaxseed, South Dakota, 1967-1971.

Year	Production*	Farm	Storage†	Total
			Off-Farm (000 bu.)	
1967	6,591,000	1,504	1,309	2,813
1968	7,882,000	1,582	1,320	2,902
1969	9,454,000	2,225	2,344	4,569
1970	7,392,000	2,931	3,925	6,856
1971	5,980,000	2,661	3,912	6,573

Source:

1. South Dakota Crop and Livestock Reporting Service, *South Dakota Agriculture, 1967-1970* (Sioux Falls, South Dakota and United States Department of Agriculture, 1967-70).

2. Ibid., *South Dakota Crop and Livestock Reporter*, January 26, 1972.

*Crop year begins July 1 of year stated.

†Flaxseed in storage on January 1 of year stated.

Table 22. South Dakota Flaxseed Production, and Country Elevator Receipts and Shipments, 1970.

Area	Production (000 bu.)	Receipts* (000 bu.)	Receipts/ Production	Shipments† (000 bu.)	Shipments/ Production
			(%)		(%)
I	193	41	21.2	45	23.3
II	1,444	1,392	96.4	1,341	92.9
III	4,559	4,006	87.9	3,604	79.1
IV	93	90	96.8	66	71.0
V	1,099	1,207	110.0	988	89.9
VI	3	0	0	0	0
State‡	7,392	6,735	91.0	6,043	81.8

*Out-of-state origins accounted for the following proportions of receipts:

Area II, 5.3 percent; Area III, 1.9 percent; state average, 2.3 percent.

†Flaxseed owned by the Commodity Credit Corporation accounted for the following proportions of shipments: Area I, 48.0 percent; Area II, 34.1 percent; Area III, 28.6 percent; Area IV, 22.7 percent; Area V, 37.9 percent; state average, 31.5 percent. Shipments also include flaxseed retailed back to farmers.

‡Detail may not add to total due to rounding.

Source: Production data from South Dakota Crop and Livestock Reporting Service, *South Dakota Agriculture, 1967-1970* (Sioux Falls, South Dakota and United States Department of Agriculture, 1967-1970).

Elevators, by Destination and Mode of Shipment, 1970.*

Table 23. Mode of Flaxseed Shipments from South Dakota Country Elevators, 1970.

Area	Rail		Truck*		Farmers, Feeders or Used in Feed		Total	
	(000 bu.)	(%)	(000 bu.)	(%)	(000 bu.)	(%)	(000 bu.)	(%)
I	21	46.7	24	53.3	0	0	45	100
II	879	65.5	462	34.5	0	0	1,341	100
III	2,387	66.2	1,204	33.4	13	0.4	3,604	100
IV	43	65.2	23	34.8	0	0	66	100
V	623	63.1	365	36.9	0	0	988	100
VI	0	0	0	0	0	0	0	0
State	3,953	65.4	2,078	34.4	13	0.2	6,043	100

*Does not include flaxseed retailed back to farmers.

†Detail may not add to total because of rounding.

Table 24. Disposition of Flaxseed Shipped by Rail from South Dakota Country Elevators, 1970.*

Area	Disposition								
	A		B		C		D		E
	In-State (000 bu.)	(%)	Out-of-State (000 bu.)	(%)	Ordinary (000 bu.)	Boxcars (%)	Covered Hopper Cars (000 bu.)	(%)	Total (000 bu.)
I	0	0	21	100	21	100.0	0	0	21
II	0	0	879	100	538	61.1	341	39.9	879
III	0	0	2,387	100	1,958	82.0	429	18.0	2,387
IV	0	0	43	100	20	46.5	23	53.5	43
V	0	0	623	100	562	90.3	61	9.7	623
VI	0	0	0	0	0	0	0	0	0
State†	0	0	3,953	100	3,099	78.4	854	21.6	3,953

*A + B = C + D = E.

†Detail may not add to total because of rounding.

Table 25. Disposition of Flaxseed Shipped by Truck from South Dakota Country Elevators, 1970.*

Area	A		B		Disposition C		D		E
	In-State (000 bu.)	(%)	Out-of State (000 bu.)	(%)	Backhaul (000 bu.)	(%)	One-way (000 bu.)	(%)	Total† (000 bu.)
I	0	0	24	100.0	1	5.9	23	94.1	24
II	0	0	462	100.0	131	28.4	331	71.6	462
III	10	0.8	1,194	99.2	191	15.9	1,013	84.1	1,204
IV	0	0	23	100.0	21	92.5	2	7.5	23
V	13	3.7	352	96.3	102	28.0	263	72.0	365
VI	0	0	0	0	0	0	0	0	0
State‡	21	1.0	2,057	99.0	447	21.5	1,631	78.5	2,078

*Does not include flaxseed retained back to farmers.

†A + B = C + D = E.

‡Detail may not add to total due to rounding.

Table 26. Flaxseed Shipments from South Dakota Country

Destination	Rail		Truck†	
	(000 bu.)‡	(%)	(000 bu.)‡	(%)
Brookings			11	0.5
Watertown			10	0.5
South Dakota (sub-total)	0	0	21	1.0
Arkansas			6	0.2
Iowa	71	1.8		
Minnesota	3,882	98.2	2,045	98.6
Texas			6	0.2
Out-of-State (sub-total)	3,953	100.0	2,057	99.0
Total Shipments	3,953	100.0	2,078	100.0

*Destination of 4 percent of the truck traffic was reported as "unknown" and was allocated in proportion to distribution of known truck shipments.

†Does not include flaxseed retained back to farmers.

‡Detail may not add to total due to rounding.

Table 27. Destination of Flaxseed Shipped by Rail from South Dakota Country Elevators, by Area, 1970.

Destination	Area					
	I	II	III	IV	V	VI
	(000 bu.)					
In-State (sub-total)						
Sioux City, Iowa					71	
Minneapolis, Minn.	21	879	2,387	43	552	
Out-of-State (sub-total)	21	879	2,387	43	623	
Total Shipments*	21	879	2,387	43	623	

*Detail may not add to total because of rounding.

Table 28. Destination of Flaxseed Shipped by Truck from South Dakota Country Elevators, by Area, 1970.

Destination	Area					
	I	II	III	IV	V	VI
	(000 bu.)					
Brookings					11	
Watertown			10			
In-State (sub-total)			10		11	
Arkansas					5	
Minneapolis, Minn.	24	399	1,146	23	202	
Red Wing, Minn.		44	48		67	
Texas					5	
Out-of-State (sub-total)	24	443	1,194	23	279	
Unknown		20			76	
Total Shipments*	24	463	1,204	23	365	

*Detail may not add to total because of rounding.

SUMMARY

South Dakota grain elevators received an estimated 53,353,000 bushels of wheat, soybeans, and flaxseed during calendar year 1970. This was about 104 percent of the state's production. Shipments out of elevators were an estimated 52,584,000 bushels, or about 102 percent of production. Railroads carried 74 percent of out-shipments, with trucks carrying the remaining 26 percent. Minnesota was the primary destination for wheat and flaxseed shipments, with Iowa points receiving most soybean shipments.

Grain elevators received 40,667,000 bushels of wheat during 1970 and shipped out 40,167,000 bushels. Trucks carried 18 percent of shipments⁹ with railroads carrying 82 percent. All reported truck shipments and 96 percent of rail shipments went out-of-state. Minnesota was the primary destination for both modes of shipment (Figure 5).

Soybean receipts were 5,951,000 bushels with out-shipments of 6,374,000 bushels. Trucks carried 64 percent of shipments,¹⁰ railroads 36 percent. Nearly all shipments went out-of-state, points in Iowa and Minnesota the primary destinations (Figure 6).

Flaxseed delivered to country elevators totaled 6,735,000 bushels during 1970. Shipments out of elevators were 6,043,000 bushels. Minnesota received 98 percent of all shipments (Figure 7). Railroads accounted for 65 percent of shipments with trucks carrying 35 percent.¹¹

Since nearly all shipment of wheat, soybeans, and flaxseed move out-of-state, dependable, long distance transportation is vital to the South Dakota grain industry. Railroads are currently the dominant mode of transportation for wheat and flaxseed shipments, with soybeans moving to relatively closer destinations

⁹Includes less than one percent retained back to farmers or used in feed sold by elevators.

¹⁰Includes less than one percent retained back to farmers.

¹¹Includes less than one percent retained back to farmers.

primarily by truck. However, declining elevator numbers plus accelerating rates of railroad abandonment place future shipment methods and patterns in doubt.

These changes call for a state-wide transportation plan to insure adequate future transportation services, based upon present production and shipment patterns. But it should also consider future rail abandon-

ment and possible shifts in agricultural production. Transportation requirements for present and future industrial firms also should be a vital part of the plan. The present study is designed to provide an input for the future transportation plan by quantifying the destination, volume, and method of shipment for wheat, soybeans, and flaxseed from grain elevators.

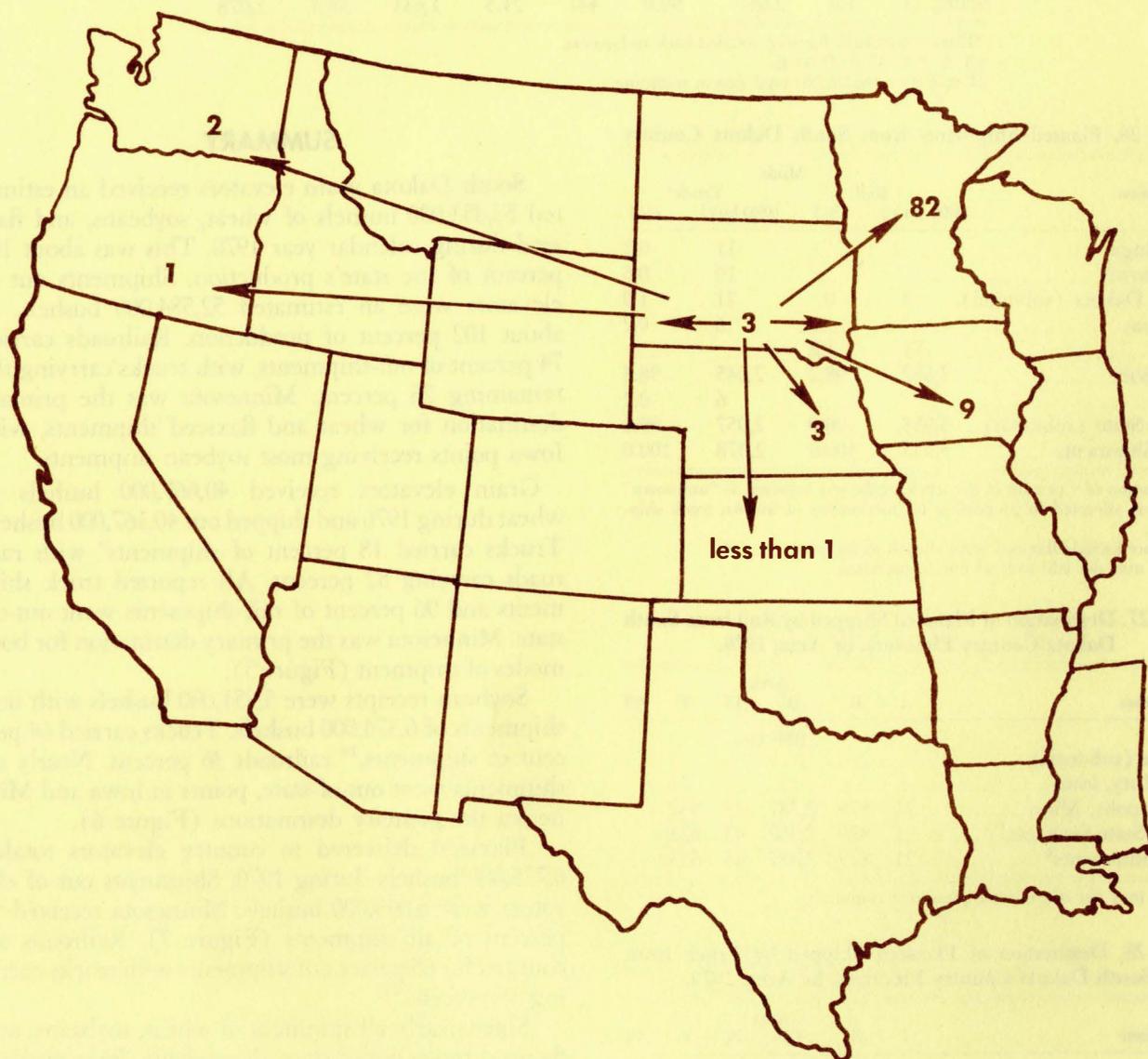


Figure 5. Percentage of total wheat shipments from South Dakota country elevators to each destination state, 1970.*†

*Detail may not add to 100 percent due to rounding.

†Does not include wheat retailed back to farmers or feeders or used in feed sold by country elevators.

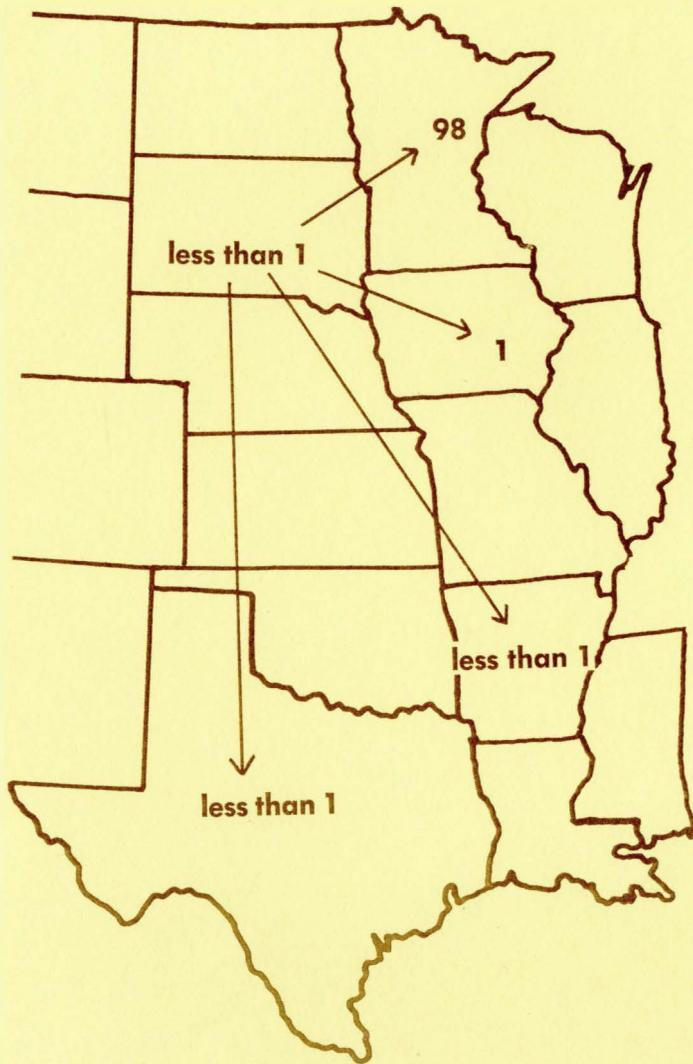


Figure 7. Percentage of total flaxseed shipments from South Dakota country elevators to each destination state, 1970.*†

*Detail may not add to 100 percent due to rounding.
†Does not include flaxseed retailed back to farmers.



Figure 6. Percentage of total soybean shipments from South Dakota country elevators to each destination state, 1970*†

*Detail may not add to 100 percent due to rounding.
†Does not include soybeans retailed back to farmers.

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